

**CLAIMS:**

I claim:

1. A pivot mechanism for attaching an arm to an implement about a pivot axis, the mechanism comprising:

a pivot bracket attached to the implement and defining a bracket pivot hole, and having first and second bracket surfaces oriented substantially perpendicular to the pivot axis;

an inner bushing rotatably mounted in the bracket pivot hole; and defining a pivot pin hole therethrough;

an arm defining an arm pivot hole aligned with the bracket pivot hole such that an inner surface of the arm is substantially parallel to the first bracket surface;

a pivot plate defining a plate pivot hole aligned with the bracket pivot hole such that an inner surface of the pivot plate is substantially parallel to the second bracket surface;

wherein the inner bushing is fastened to one of the arm and pivot plate,

a first wear pad located between the inner surface of the arm and the first bracket surface;

a second wear pad located between the inner surface of the pivot plate and the second bracket surface;

a pivot pin aligned with the pivot axis and extending through the plate pivot hole, the pivot pin hole, and the arm pivot hole, wherein the pivot pin is secured to the inner bushing, and wherein the pivot pin is operative to adjustably squeeze the arm and pivot plate against the wear pads;

a connector connecting the arm and the pivot plate such that the pivot pin, the arm, the inner bushing, and the pivot plate rotate together about the pivot axis.

2. The apparatus of Claim 1 wherein the pivot pin is threaded and the inner bushing is threaded onto the pivot pin and tightened against one of the arm and the pivot plate.
3. The apparatus of Claim 2 further comprising a lock nut threaded onto at least one

end of the pivot pin.

4. The apparatus of Claim 3 comprising a lock nut threaded onto each end of the pivot pin.
5. The apparatus of Claim 1 wherein the connector comprises a clamp operative to adjustably squeeze the arm and pivot plate against the wear pads at a location removed from the pivot pin.
6. The apparatus of Claim 5 wherein the clamp comprises a bolt passing through aligned holes in the arm and pivot plate at a location such that the bolt clears the pivot bracket.
7. The apparatus of Claim 6 wherein the bolt is located beyond an outer edge of the pivot bracket.
8. The apparatus of Claim 7 wherein the bolt passes through a slot in the pivot bracket, the slot configured to allow the arm to pivot with respect to the pivot bracket through a desired pivot range.
9. The apparatus of Claim 1 further comprising an outer bushing in the bracket pivot hole, the outer bushing defining a bushing hole, and wherein the inner bushing is

rotatably mounted in the bushing hole.

10. The apparatus of Claim 1 wherein the connector comprises a bolt passing through the arm, the pivot plate, and through a slot in the pivot bracket, the slot configured to allow the arm to pivot with respect to the pivot bracket through a desired pivot range.
11. A furrow opener apparatus comprising an arm attached to an implement by the pivot mechanism of Claim 1.
12. A furrow opener apparatus comprising an arm attached to an implement by a first pivot mechanism of Claim 1, and further comprising a leg attached to the arm by a second pivot mechanism of Claim 1.
13. A pivot mechanism for attaching a first member to a second member about a pivot axis, the mechanism comprising:

a first member defining a first pivot hole, and having first and second bearing surfaces oriented substantially perpendicular to the pivot axis;

an second member defining a second pivot hole aligned with the first pivot hole such that an inner surface of the second member is substantially parallel to the

first bearing surface;

a pivot plate defining a plate pivot hole aligned with the first and second pivot holes such that an inner surface of the pivot plate is substantially parallel to the second bearing surface;

a first wear pad located between the inner surface of the second member and the first bearing surface;

a second wear pad located between the inner surface of the pivot plate and the second bearing surface;

a pivot pin aligned with the pivot axis and extending through the plate pivot hole and the first and second pivot holes;

clamp means operative to adjustably squeeze the pivot plate and second member against the wear pads;

a connector connecting the second member and the pivot plate such that the second member and the pivot plate rotate together about the pivot axis with respect to the first member.

14. The apparatus of Claim 13 wherein the pivot pin is threaded and wherein the clamp means comprises a lock nut threaded on at least one end of the pivot pin.
15. The apparatus of Claim 13 further comprising bushing means in the first pivot hole.
16. The apparatus of Claim 15 wherein the bushing means comprises an outer bushing secured in the first pivot hole, and an inner bushing rotatable in the outer bushing, the inner bushing secured to the pivot pin and secured to one of the second member and the pivot plate so as to rotate therewith.
17. A residue deflector apparatus adapted for attachment to a dual furrow opener apparatus, wherein the dual furrow opener apparatus comprises a front furrow opener leg and a rear furrow opener leg positioned behind and to a first side of the front furrow opener leg, and further comprises a furrow opening device at the bottom of each leg for engaging the ground and forming a furrow, the deflector apparatus comprising:

a shield adapted for attachment to the front leg, the shield extending from approximately ground level on the front leg up to an upper portion of the front leg, and from ground level on the front leg tapering outward toward the first side of the front leg such that an upper portion of the shield extends outward beyond the

second leg such that crop residue falling off the upper portion of the shield falls beyond a path of the rear leg, and wherein the shield curves rearward as it tapers outward.

18. The apparatus of Claim 17 wherein the shield is adapted for attachment along a second side of the front leg such that the shield wraps around a front edge of the front leg.
19. The apparatus of Claim 18 wherein a front of the shield is rounded to facilitate residue sliding off the front leg towards either side.
20. The apparatus of Claim 17 wherein the shield comprises a smooth surface to facilitate residue sliding off the shield.